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A NEW SPECIES OF *PHERBELLIA* ROBINEAU-DESVOIDY WITH NOTES ON THE *P. VENTRALIS* GROUP (DIPTERA: SCIOMYZIDAE)

R. E. Orth, G. C. Steyskal, and T. W. Fisher

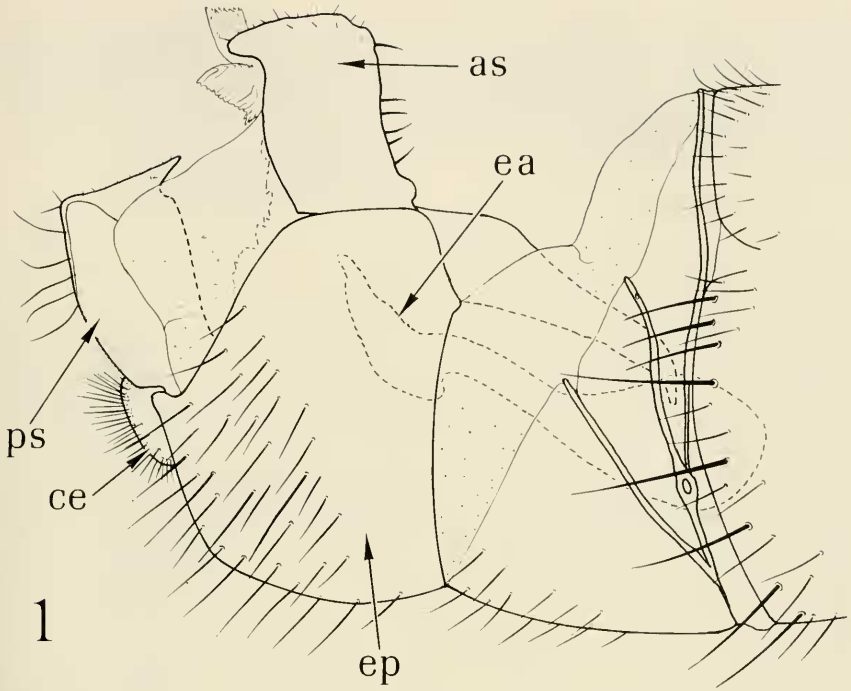
(REO, TWF) Department of Entomology, Division of Biological Control, University of California, Riverside, California 92521; (GCS) Systematic Entomology Laboratory, IIBIII, Agric. Res., Sci. and Educ. Admin., USDA, % U.S. National Museum of Natural History, Washington, D.C. 20560.

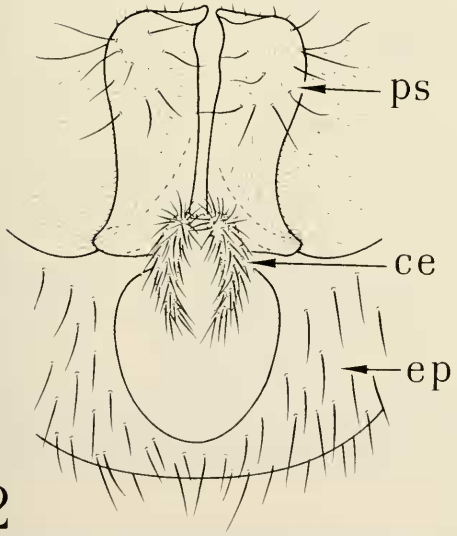
Abstract.—*Pherbellia* **subtilis**, n. sp., from North America, is separated from the Holarctic *P. obscura* Ringdahl. Terminalia illustrations and geographic distribution are given for *P. obscura* Ringdahl, *P. subtilis*, n. sp., and *P. ventralis* (Fallén). All are members of the *P. ventralis* group.

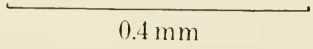
Worldwide within the family Sciomyzidae, *Pherbellia* (tribe Sciomyzini) is the largest genus, comprising 104 nominal species (Bratt et al., 1969). In addition, there are numerous undescribed species which bear manuscript names. The definitive work on the biology of *Pherbellia* was written by Bratt et al. (1969). The larvae of all *Pherbellia* species whose life histories are known are obligate snail feeders and are typical of all Sciomyzini in that all are terrestrial in development. Well-developed float hairs that typify the aquatic Tetanocerini are lacking in Sciomyzini. The first-instar larva is parasitoid, its host snail dying after being fed upon for several days. The larva may then feed on the decaying tissues of the host snail. As development continues second- and third-instar larvae in some cases behave as overt predators quickly killing their host snails.

This paper is concerned with closely related species in the subgenus *Chetocera* according to Rozkošný's (1964) subgeneric classification. These species belong to the *P. ventralis* group. This group comprises both Palaearctic and Nearctic species which, according to Steyskal (1966), includes *Pherbellia ventralis* (Fallén), *P. scutellaris* Roser, and *P. bezzii* Hendel (1902) [=*P. pallidicarpa* Rondani (1868) (Verbeke, 1964)]. *Pherbellia obscura* Ringdahl and the new species *P. subtilis*, which is here separated from *P. obscura*, are also included in this group.

Key characters which separate *Pherbellia obscura*, *P. subtilis*, and *P. ventralis* from other members of the genus are: Frons with median stripe







Figs. 1–3. *Pherbellia subtilis*, holotype male. 1, Postabdomen, sinistral view, inverted. 2, Posterior view of postabdomen, inverted. 3, Anterior surstylus, viewed in broadest aspect. as = anterior surstylus; ce = cerci; ea = ejaculatory apodeme; ep = epandrium; ps = posterior surstylus.

less than ⅔ as long as distance from ocellus to frontal margin; mesopleuron entirely bare; wing not patterned; halter yellowish white; first vein distinctly surpassing level of *ta*; arista bare; hind femur and tibia not blackened at tips; pteropleural setae all subequal in length; antenna testaceous, without well marked blackish tip.

Pherbellia subtilis Orth and Steyskal, New Species
Figs. 1–6

P. obscura: Bratt et al. 1969: 73–74 (in part).
P. ventralis: Steyskal 1965: 687 (misidentification).

Holotype male.—Height of head ⅔ width. Medifacies yellowish pruinose, facial grooves subshiny, parafacies and cheeks pruinose yellowish to whitish respectively. Frons dull yellowish, slightly narrowed anteriorly. Mid-frontal stripe extending less than ½ distance from anterior ocellus to anterior margin of frons. Ocellar triangle and orbital plates with greyish pruinosity. Orbital plates strongly tapered anteriorly, extending slightly beyond midfrontal stripe. Orbito-antennal spot light brown, indistinct; narrow strip of grey pruinosity along upper orbital margin. Two pairs of fronto-orbital bristles, anterior pair ⅔ as long; ocellars, postocellars, and inner and outer verticals well developed. Occiput greyish pruinose. Short black setae on lower ⅔ of cheeks and parafacies on anterior ½ of frons, between ocellar and postocellar bristles, along outer parts of orbital plates, and in midcervial patch. Lateral occipital margins with stronger setae and bristles. Antennae testaceous, segment 3 elongate oval, dorsal margin straight. Arista brownish black, without hairs. Palpi yellowish, labium and labella brownish.

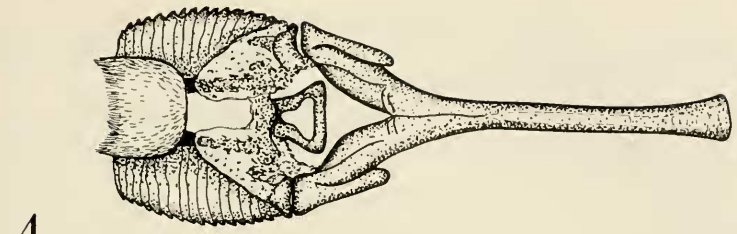
Thorax grey, pruinose dorsally with darker grey pruinose longitudinal stripes. Mesopleuron with trace of brown posteriorly. Remainder of thoracic surfaces grey pruinose. Mesopleuron bare. Pteropleuron with cluster of 8 bristles of nearly equal size; no vallar bristles. Sternopleuron with fine, short setae over most of surface and well-developed bristles ventrally. Prosternum bare.

Coxae testaceous with silvery pruinosity. Fore femur and tibia brownish black. Tarsal segments light brown. Mid and hind legs entirely testaceous, slightly infumated.

Wing length 4.0 mm. Membrane greyish-yellow hyaline; costal margin and wing veins testaceous to brownish; crossveins very slightly infuscated. No stump veins; anterior crossvein oblique, first vein ending well beyond level of anterior crossvein; anal vein reaching wing margin. Halter, squama, and squamal ciliae yellowish white.

Abdominal segments testaceous, slightly infumated dorsally; andrium testaceous; postabdomen as in Figs. 1–3; copulatory apparatus as in Figs. 4–6.

Allotype female.—Same as holotype except as follows: Abdominal segments testaceous mottled with brown. Wing length 4.5 mm.



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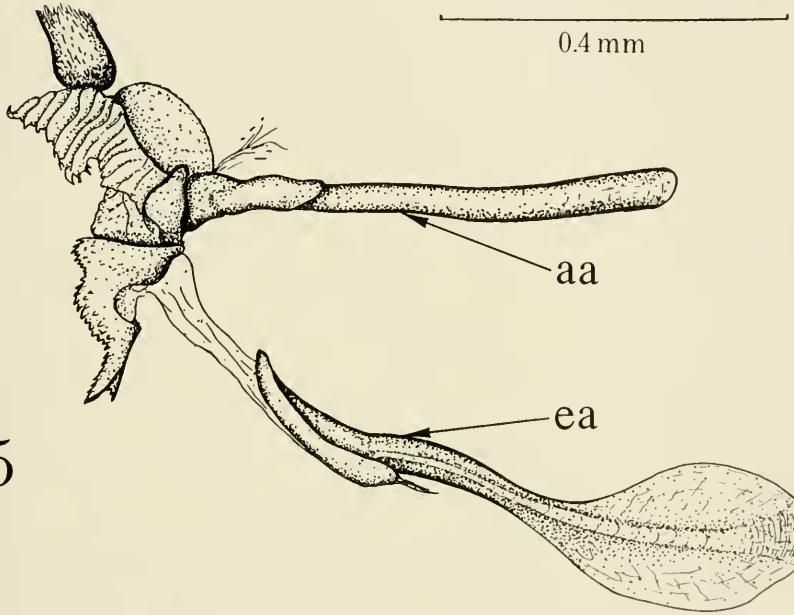

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Figs. 4–6. *Pherbellia subtilis*, holotype male. 4, Aedeagal complex, ventral view. 5, Aedeagus and apodemes, lateral view, inverted. 6, Ejaculatory apodeme, ventral view. aa = aedeagal apodeme; ea = ejaculatory apodeme.

Holotype.—Male, California, Mendocino Co., 3.2 km N of Willits, Hwy. 101, 23 April 1968, elevation 405 m, T. W. Fisher–R. E. Orth, field notes accession no. AS-669. U.S. National Museum of Natural History Type no. 75550.

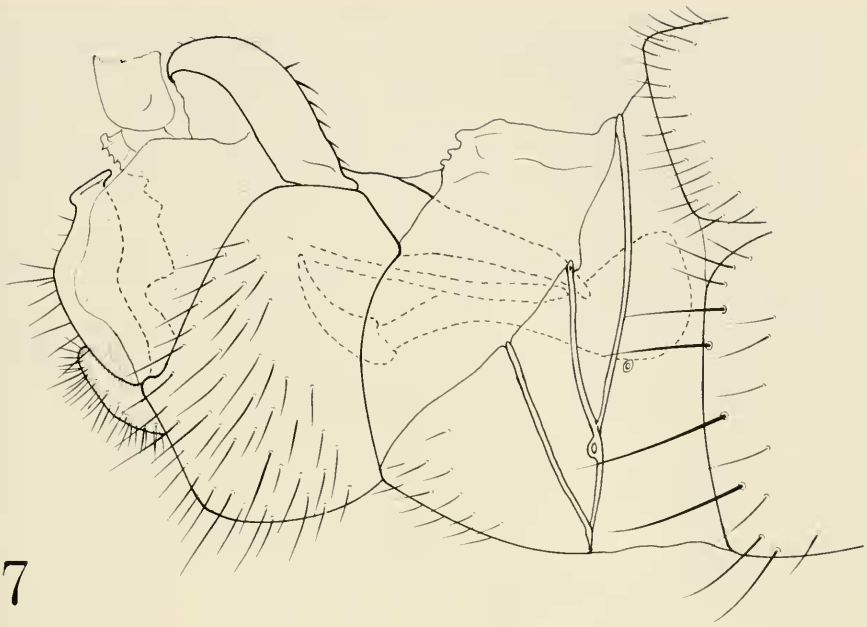
Allotype.—Female, California, Mendocino Co., 3.2 km N of Willits, Hwy. 101, 24 April 1968, 405 m, T. W. Fisher–R. E. Orth, field notes accession no. AS-671. Deposited with holotype.

Paratypes.—Restricted to California material collected by T. W. Fisher and R. E. Orth. Alpine Co., Hope Valley, 3.2 km NW of junction of Hwy. 88 and 89, 2253 m, 12 July 1966 (1 ♂); 3.2 km S of Woodfords, Hwy. 89, 1798 m, 11 July 1966 (1 ♂); Inyo Co., 12 mi W of Big Pine, 2316 m, 22 May 1968 (1 ♀); Marin Co., 3.2 km NW of Bolinas, 24 April 1968 (1 ♂); Mendocino Co., 3.2 km N of Willits, Hwy. 101, 405 m, 24 May 1967, 23 and 24 April 1968 (3 ♀♀, 20 ♂♂); Nevada Co., 1.6 km NW of Boca Springs, 1753 m, 7 June 1966 (1 ♂); Riverside Co., Lake Hemet, 1372 m, 22 April 1965, 16 March and 29 April (1 ♀, 2 ♂♂); San Bernardino Co., Little Cienega Seca, 2347 m, 24 and 31 May 1966, 18 May and 19 June 1967, 16 May 1968, 11 and 17 June 1970 (22 ♀♀, 14 ♂♂). At the California Academy of Sciences, University of California at Riverside, and the U.S. National Museum of Natural History.

Other specimens.—In addition we have seen material from the following localities: *Alberta:* 64 km W of Edmonton, Wabamun Lake. *Manitoba:* Churchill. *California:* Fresno Co., Sequoia Lake (A. L. Melander collection); San Bernardino Co., Upper Santa Ana River (A. L. Melander collection). *Colorado:* Lake Co., Tennessee Pass. *Idaho:* Bonner Co., Priest Lake, Lookout Mt.; Elmore Co., Dixie; Latah Co., Robinson Lake. *New Mexico:* Colfax Co., Cimarron Cyn. *New York:* Tompkins Co., Ringwood, Dryden. *Oregon:* Benton Co., Mary's Peak (U.S. National Museum of Natural History material). *Washington:* Clallam Co., Bogechiel, Bogechiel River (California Academy of Science material).

Variation.—This species shows considerable variation in color. Specimens collected east of California have grey areas of the thorax often replaced in part or totally by tan or brown. The head, abdomen, and legs also show a wide range of color variation. Bristles in the cluster on the pteropleuron range in number from 5 to 10. Wing length 3.4–4.5 mm in males, 3.5–4.5 mm in females.

Discussion.—Biological information supplied for *Pherbellia obscura* by Bratt et al. (1969) must now be assigned to *P. subtilis*. Their laboratory rearings were started from adults collected April 21, 1959, at Robinson Lake, Idaho by B. A. Foote. Their field and laboratory observations indicated *Lymnaea humilis* (Say) and other species of *Lymnaea* were the preferred larval hosts. In the laboratory fly eggs were laid on and under bits of moss and on shells of *Lymnaea*. *P. subtilis* larvae were more solitary in their feeding habits than most other species of *Pherbellia*. Mature larvae left the snails' shells and pupated in the moss. We have seen material from this locality collected by B. A. Foote in May and June of 1959 which clearly keys to *P. subtilis*. His laboratory and field data and the earliest and latest



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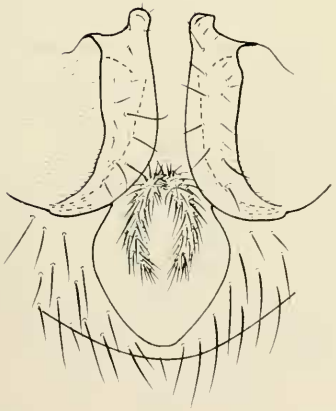
0.4 mm



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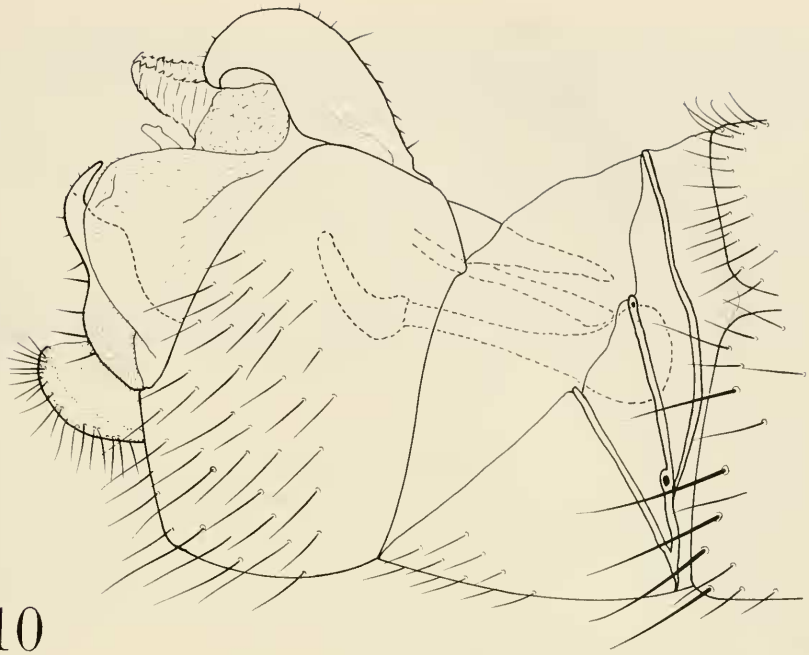
Figs. 7–9. *Pherbellia obscura*, Kvikkjokk, Norrbotten, Sweden, June 18, 1967, L. V. Knutson. 7, Postabdomen, sinistral view, inverted. 8, Posterior view of postabdomen, inverted. 9, Anterior surstylus, viewed in broadest aspect.

capture records reported by Bratt et al. (1969) (March 3, Salem, Oregon and September 9, Mt. Orford, Quebec) suggest the species is multivoltine. However, in southern California adults of *P. subtilis* have been collected only in late winter and spring. The earliest and latest collections at Lake Hemet, Riverside County, 1372 m elevation, were March 16 and April 29 (1965 to 1966), and at Little Cienega Seca, San Bernardino County, 2347 m elevation, May 16 and June 19 (1966 to 1970). Frequent collecting trips were made to these two sites throughout the year with no extension of seasonal capture records. Therefore, our data indicate the species is univoltine in southern California. At one or both sites adults were associated with the following sciomyzid species: *Antichaeta testacea* Melander, *Atrichomelina pubera* (Loew), *Dictya montana* Steyskal, *Hoplodictya acuticornis* (van der Wulp), *Pherbellia nana* (Fallén), *P. parallela* (Walker), *P. trabeculata* (Loew), *P. vitalis* (Cresson), *Sepedon bifida* Steyskal, *S. pacifica* Cresson, and *Tetanocera plumosa* Loew. Snails found at one or both sites included *Succinea californiensis* Fischer and Crosse, *Physa virgata* (Gould), *Helisoma tenue californiensis* Baker, and snails in the genera *Lymnaea* and *Stagnicola*.

The three species within the *P. ventralis* group which most closely resemble each other are *Pherbellia ventralis* (Figs. 10–12), *P. obscura* (Figs. 7–9), and *P. subtilis*, n. sp. (Figs. 1–6). Excellent terminalia drawings of *P. ventralis* are in Rozkošný's (1966) review of Czechoslovakian Sciomyzidae. Ringdahl (1948) illustrated the anterior surstyli of *P. ventralis* and *P. obscura*. These three species we assume to be monophyletic. They cannot be separated with any degree of confidence by external characters because color, size, and setation are too variable. Positive identification can be made by examination of the male terminalia. For interpretation of the male copulatory apparatus (Figs. 4–6) refer to Steyskal and Knutson (1975). Geographic determination is also possible if locality data indicate that specimens were collected in areas far removed from areas of overlap.

Pherbellia ventralis is a Palaearctic species whose distribution has not been fully documented. According to Bratt et al. (1969), "*Pherbellia ventralis* is one of 6 species of Sciomyzidae known from Iceland. It has also been taken in the northern and southern parts of the British Isles and from central Sweden (Umeå) southward to Spain (Canet, near Valencia), Greece (Corfu), and Turkey (Istanbul)." In Steyskal (1965: 687), the distribution for *P. ventralis* in the United States should be ascribed to *P. subtilis*.

Pherbellia obscura is a Holarctic species. All northern Fennoscandian records according to Bratt et al. (1969) are probably *P. obscura* rather than *P. ventralis*. North American specimens seen by the authors place *P. obscura* in Canada and Alaska; records from south of Canada are suspect. The known range for *P. subtilis* extends from southwestern Canada southward to southern California. Capture records also exist from New Mexico, Colorado, and New York. Our records show that the distributions of these



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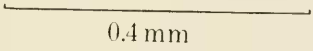

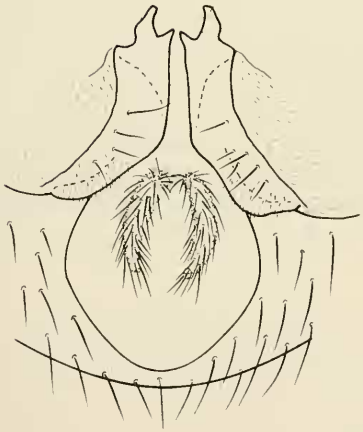

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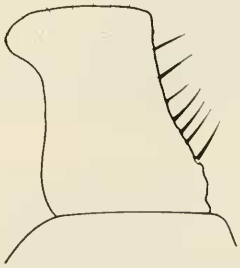

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Figs. 10–12. *Pherbellia ventralis*, 1 km N of Tzavrou, Merlin Marsh, Corfu, 6–14 May, 1963, L. V. Knutson. 10, Postabdomen, sinistral view, inverted. 11, Posterior view of postabdomen, inverted. 12, Anterior surstylus, viewed in broadest aspect. Note: Anterior and posterior surstylus strongly directed inward.

two species overlap in Alberta. The northernmost record we have of *P. subtilis* is from Wabamun Lake west of Edmonton. The southernmost record we have for *P. obscura* is from Banff. This represents an overlap of 240 kilometers for these species. Geographic isolation seems unlikely. Scarcity of material at present limits our distributional information; however, sympatric distribution of these two species will probably be confirmed in southern Canada when additional specimens are seen.

Acknowledgments

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